FCC REPORT

Applicant: Grand Electronics INC.

Address of Applicant: 11650 Brentcross Dr Tomball Texas United States 77377

Equipment Under Test (EUT)

Product Name: Tablet PC

Model No.: K1S

Trade mark: neutab.

FCC ID: 2AGNKK1S1

Applicable standards: FCC CFR Title 47 Part 15 Subpart B

Date of sample receipt: 27 Dec., 2017

Date of Test: 27 Dec., 2017 to 23 Feb., 2018

Date of report issued: 26 Feb., 2018

Test Result: PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Bruce Zhang
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

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2 Version

Version No.	Date	Description
00	*26 Feb., 2018*	*Original*

Tested by: Mike.ou ***Date:*** *26 Feb., 2018*

Test Engineer

Reviewed by: Winner zhang ***Date:*** *26 Feb., 2018*

Project Engineer

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4 Test Summary

Test Item	Section in CFR 47	Result
Conducted Emission	Part 15.107	Pass
Radiated Emission	Part 15.109	Pass
Remark: *Pass: The EUT complies with the essential requirements in the standard.* *N/A: The EUT not applicable of the test item.*		

5 General Information

5.1 Client Information

Applicant:	Grand Electronics INC.
Address of Applicant:	11650 Brentcross Dr Tomball Texas United States 77377
Manufacturer/ Factory:	Dongguan Digi-in Digital Technology Co., Ltd
Address:	Jiatian Industrial Park, Wulian, Fenggang Town, Dongguan City, Guangdong, China

5.2 General Description of E.U.T.

Product Name:	Tablet PC
Model No.:	K1S
Power supply:	Rechargeable Li-ion Battery DC3.7V/5000mAh
AC adapter :	Model No.: UF22P1501 Input: AC100-240V, 50/60Hz, 0.5 A Output: DC 5.0V, 2.1A or DC 9.0V, 1.67A or DC 12.0V, 1.25A

5.3 Test Mode

Operating mode	Detail description
PC mode	Keep the EUT in Downloading mode(Worst case)
Charging+Recording mode	Keep the EUT in Charging+Recording mode
Charging+Playing mode	Keep the EUT in Charging+Playing mode
The sample was placed 0.8m above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.	

5.4 Measurement Uncertainty

Items	Expanded Uncertainty (Confidence of 95%)
Conducted Emission (9kHz ~ 30MHz)	2.14 dB (k=2)
Radiated Emission (9kHz ~ 30MHz)	4.24 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	4.35 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	4.44 dB (k=2)
Radiated Emission (18GHz ~ 26.5GHz)	4.56 dB (k=2)

5.5 Description of Support Units

Manufacturer	Description	Model	Serial Number	FCC ID/DoC
DELL	PC	OPTIPLEX745	N/A	DoC
DELL	MONITOR	E178FPC	N/A	DoC
DELL	KEYBOARD	SK-8115	N/A	DoC
DELL	MOUSE	MOC5UO	N/A	DoC
LENOVO	Laptop	SL510	2847A65	DoC

5.6 Related Submittal(s) / Grant (s)

This is an original grant, no related submittals and grants.

5.7 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC - Registration No.: 727551**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC (Federal Communications Commission). The Registration No. is 727551.

- **IC - Registration No.: 10106A-1**

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

- **CNAS - Registration No.: CNAS L6048**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

- **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: https://portal.a2la.org/scopepdf/4346-01.pdf

5.8 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.
Address: No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,
Bao'an District, Shenzhen, Guangdong, China
Tel: +86-755-23118282, Fax: +86-755-23116366
Email: info@ccis-cb.com, Website: http://www.ccis-cb.com

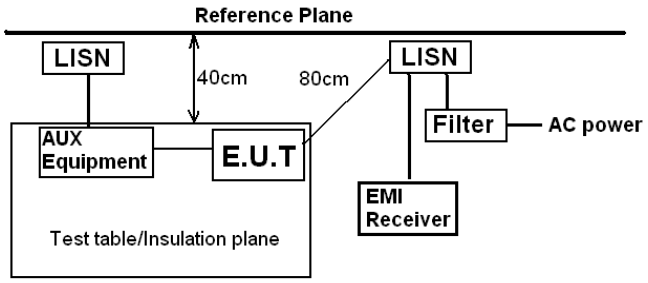
5.9 Test Instruments list

Radiated Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal. Date (mm-dd-yy)**	**Cal. Due date (mm-dd-yy)**
1	3m SAC	SAEMC	9(L)*6(W)* 6(H)	CCIS0001	07-22-2017	07-21-2020
2	BiConiLog Antenna	SCHWARZBECK	VULB9163	CCIS0005	02-25-2017	02-24-2018
					02-22-2018	02-21-2019
3	Horn Antenna	SCHWARZBECK	BBHA9120D	CCIS0006	02-25-2017	02-24-2018
					02-22-2018	02-21-2019
4	Pre-amplifier (10kHz-1.3GHz)	HP	8447D	CCIS0003	02-25-2017	02-24-2018
					02-22-2018	02-21-2019
5	Pre-amplifier (1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	CCIS0011	02-25-2017	02-24-2018
					02-22-2018	02-21-2019
6	Spectrum analyzer 9k-30GHz	Rohde & Schwarz	FSP30	CCIS0023	02-25-2017	02-24-2018
					02-22-2018	02-21-2019
7	EMI Test Receiver	Rohde & Schwarz	ESRP7	CCIS0167	02-25-2017	02-24-2018
					02-22-2018	02-21-2019
8	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
9	Coaxial Cable	N/A	N/A	CCIS0018	02-25-2017	02-24-2018
					02-22-2018	02-21-2019
10	Coaxial Cable	N/A	N/A	CCIS0020	02-25-2017	02-24-2018
					02-22-2018	02-21-2019

Conducted Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Shielding Room	ZhongShuo Electron	11.0(L)x4.0(W)x3.0(H)	CCIS0061	07-22-2017	07-21-2020
2	EMI Test Receiver	Rohde & Schwarz	ESCI	CCIS0002	02-25-2017	02-24-2018
					02-22-2018	02-21-2019
3	LISN	CHASE	MN2050D	CCIS0074	02-25-2017	02-24-2018
					02-22-2018	02-21-2019
4	LISN	Rohde & Schwarz	ESH3-Z5	8438621/010	07-21-2017	07-20-2018
5	Coaxial Cable	CCIS	N/A	CCIS0086	02-25-2017	02-24-2018
					02-22-2018	02-21-2019
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A

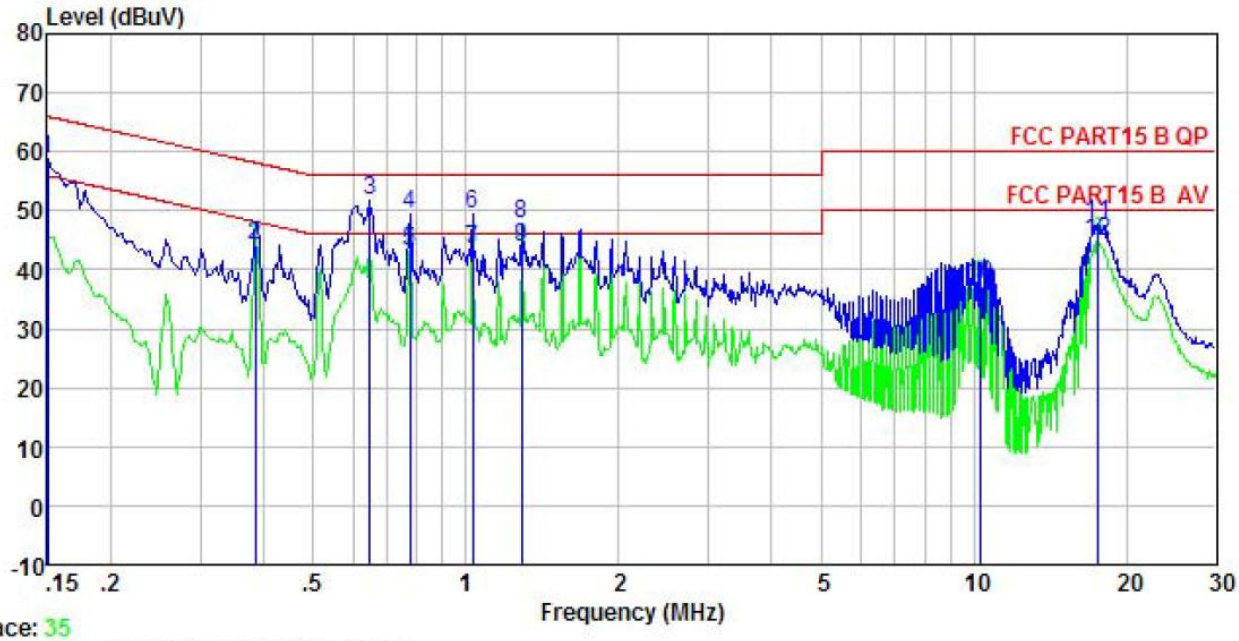
6 Test results and Measurement Data

6.1 Conducted Emission

Test Requirement:	FCC Part 15 B Section 15.107					
Test Method:	ANSI C63.4:2014					
Test Frequency Range:	150kHz to 30MHz					
Class / Severity:	Class B					
Receiver setup:	RBW=9kHz, VBW=30kHz					
Limit:	Frequency range (MHz)	Limit (dBµV)				
		Quasi-peak	Average			
	0.15-0.5	66 to 56*	56 to 46*			
	0.5-5	56	46			
	0.5-30	60	50			
	* Decreases with the logarithm of the frequency.					
Test setup:	 *Remark:* *E.U.T: Equipment Under Test* *LISN: Line Impedence Stabilization Network* *Test table height=0.8m*					
Test procedure	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network(L.I.S.N.). The provide a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.					
Test environment:	Temp.:	23 °C	Humid.:	56%	Press.:	101kPa
Test Instruments:	Refer to section 5.9 for details					
Test mode:	Refer to section 5.3 for details					
Test results:	Pass					

Measurement data:

Test Phase: Line



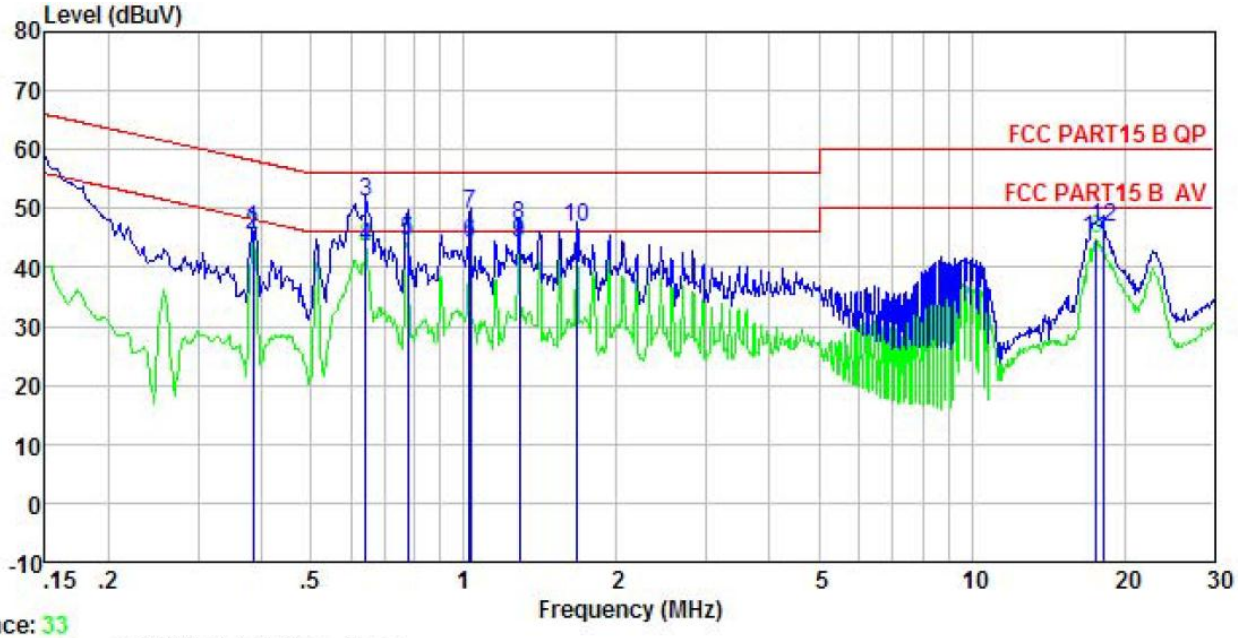
Site : CCIS Shielding Room
Condition : FCC PART15 B QP LISN(RS) LINE
EUT : Tablet PC
Model : K1S
Test Mode : PC mode
Power Rating : AC120V/60Hz
Environment : Temp: 23 ℃ Huni:56% Atmos:101KPa
Test Engineer: Mike
Remark :

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.150	47.17	0.71	10.78	58.66	66.00	-7.34	QP
2	0.385	32.75	0.75	10.72	44.22	48.17	-3.95	Average
3	0.647	40.34	0.77	10.77	51.88	56.00	-4.12	QP
4	0.775	37.77	0.77	10.80	49.34	56.00	-6.66	QP
5	0.775	31.64	0.77	10.80	43.21	46.00	-2.79	Average
6	1.032	37.65	0.78	10.87	49.30	56.00	-6.70	QP
7	1.032	31.71	0.78	10.87	43.36	46.00	-2.64	Average
8	1.289	36.24	0.78	10.90	47.92	56.00	-8.08	QP
9	1.289	32.17	0.78	10.90	43.85	46.00	-2.15	Average
10	10.342	25.97	0.72	10.94	37.63	50.00	-12.37	Average
11	17.568	36.11	0.70	10.92	47.73	60.00	-12.27	QP
12	17.568	33.24	0.70	10.92	44.86	50.00	-5.14	Average

Notes:

1. *An initial pre-scan was performed on the line and neutral lines with peak detector.*
2. *Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.*
3. *Final Level =Receiver Read level + LISN Factor + Cable Loss.*

Test Phase: Neutral



Trace: 33

Site : CCIS Shielding Room
Condition : FCC PART15 B QP LISN(RS) NEUTRAL
EUT : Tablet PC
Model : K1S
Test Mode : PC mode
Power Rating : AC120V/60Hz
Environment : Temp: 23 ℃ Huni:56% Atmos:101KPa
Test Engineer: Mike
Remark :

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.385	35.20	0.62	10.72	46.54	58.17	-11.63	QP
2	0.385	34.21	0.62	10.72	45.55	48.17	-2.62	Average
3	0.641	39.62	0.63	10.77	51.02	56.00	-4.98	QP
4	0.641	32.22	0.63	10.77	43.62	46.00	-2.38	Average
5	0.775	33.06	0.65	10.80	44.51	46.00	-1.49	Average
6	1.027	32.56	0.67	10.87	44.10	46.00	-1.90	Average
7	1.032	37.44	0.67	10.87	48.98	56.00	-7.02	QP
8	1.289	35.43	0.67	10.90	47.00	56.00	-9.00	QP
9	1.289	32.44	0.67	10.90	44.01	46.00	-1.99	Average
10	1.671	35.16	0.67	10.94	46.77	56.00	-9.23	QP
11	17.568	33.18	0.69	10.92	44.79	50.00	-5.21	Average
12	18.135	35.34	0.69	10.92	46.95	60.00	-13.05	QP

Notes:

1. *An initial pre-scan was performed on the line and neutral lines with peak detector.*
2. *Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.*
3. *Final Level =Receiver Read level + LISN Factor + Cable Loss.*

6.2 Radiated Emission

Test Requirement:	FCC Part 15 B Section 15.109
Test Method:	ANSI C63.4:2014
Test Frequency Range:	30MHz to 6000MHz
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)

Receiver setup:

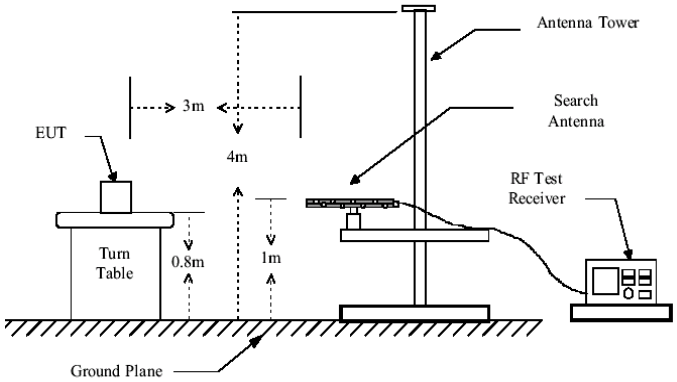
Frequency	Detector	RBW	VBW	Remark
30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
Above 1GHz	Peak	1MHz	3MHz	Peak Value
	RMS	1MHz	3MHz	Average Value

Limit:

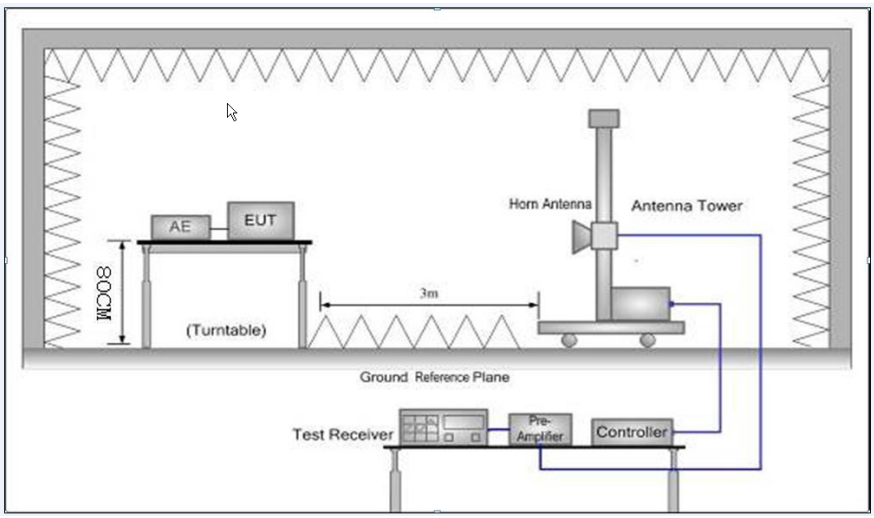
Frequency	Limit (dBuV/m @3m)	Remark
30MHz-88MHz	40.0	Quasi-peak Value
88MHz-216MHz	43.5	Quasi-peak Value
216MHz-960MHz	46.0	Quasi-peak Value
960MHz-1GHz	54.0	Quasi-peak Value
Above 1GHz	54.0	Average Value
	74.0	Peak Value

Test setup:

Below 1GHz



Above 1GHz

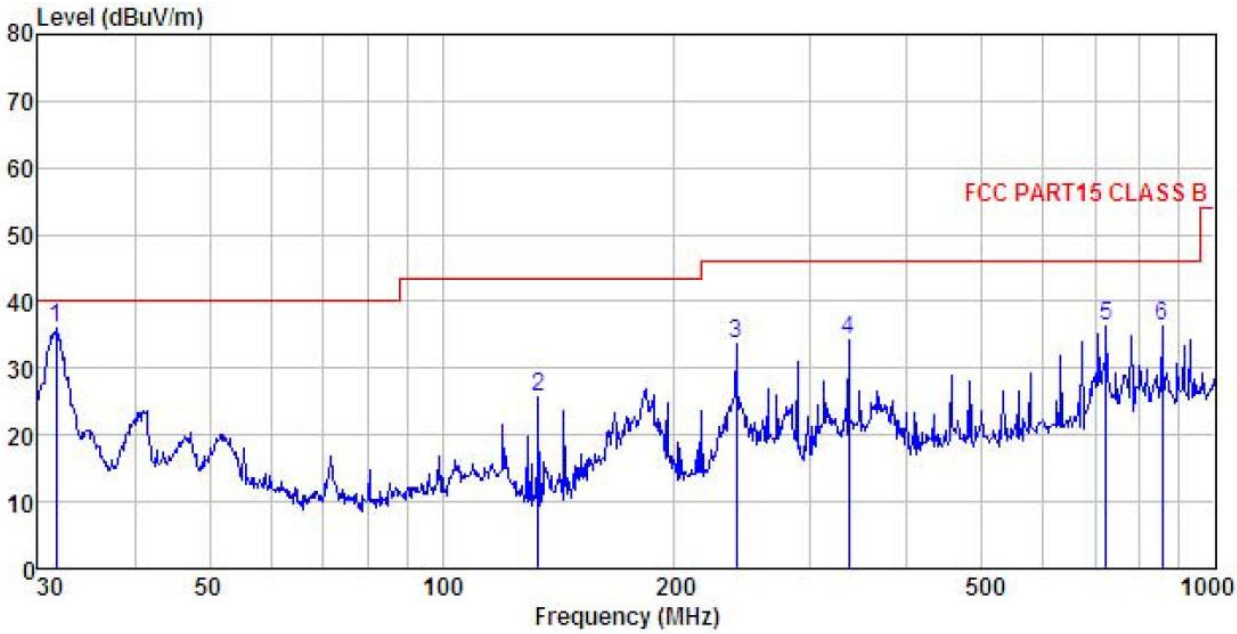


Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.					
Test environment:	Temp.:	25 °C	Humid.:	55%	Press.:	1 01kPa
Test Instruments:	Refer to section 5.9 for details					
Test mode:	Refer to section 5.3 for details					
Test results:	Passed					
Remark:	All of the observed value above 6GHz ware the niose floor , which were no recorded					

Measurement Data:

Below 1GHz

Test Polarization: Horizontal



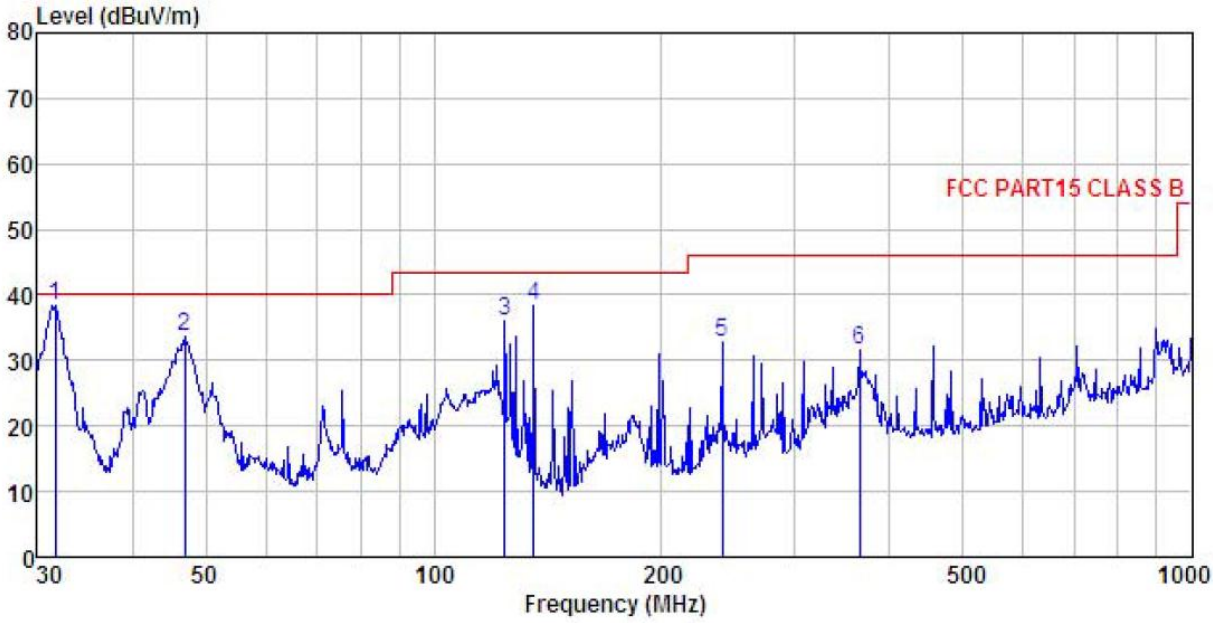
Site : 3m chamber
Condition : FCC PART15 CLASS B 3m VULB9163(30M2G) HORIZONTAL
EUT : Tablet PC
Model : K1S
Test mode : PC mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5℃ Huni:55% 101KPa
Test Engineer: Mike
REMARK :

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	31.620	53.57	11.43	0.85	29.97	35.88	40.00	-4.12	QP
2	133.151	44.03	8.54	2.32	29.31	25.58	43.50	-17.92	QP
3	239.987	47.51	11.85	2.82	28.59	33.59	46.00	-12.41	QP
4	336.035	45.54	14.10	3.05	28.53	34.16	46.00	-11.84	QP
5	724.261	41.09	19.64	4.27	28.58	36.42	46.00	-9.58	QP
6	854.025	39.41	20.60	4.15	27.99	36.17	46.00	-9.83	QP

Remark:

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Test Polarization: Vertical



Site : 3m chamber
Condition : FCC PART15 CLASS B 3m VULB9163(30M2G) VERTICAL
EUT : Tablet PC
Model : K1S
Test mode : PC mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5℃ Huni:55% 101KPa
Test Engineer: Mike
REMARK :

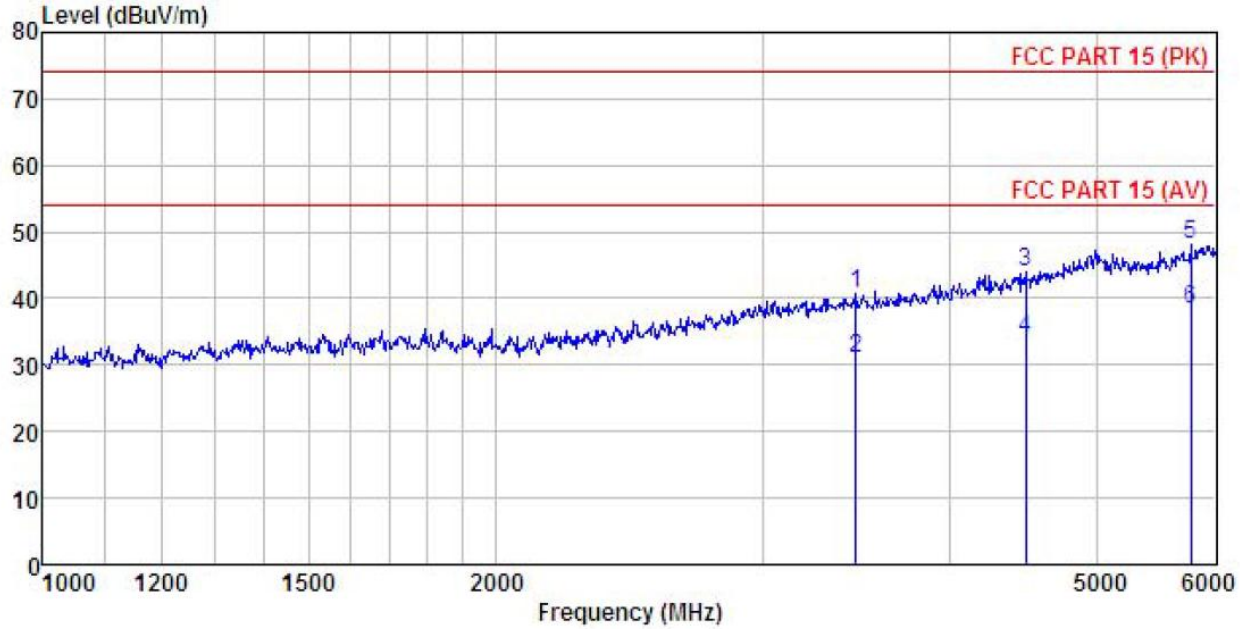
	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	31.620	56.16	11.43	0.85	29.97	38.47	40.00	-1.53	QP
2	46.995	47.69	14.40	1.27	29.84	33.52	40.00	-6.48	QP
3	124.133	53.47	9.62	2.21	29.36	35.94	43.50	-7.56	QP
4	135.506	56.79	8.42	2.35	29.30	38.26	43.50	-5.24	QP
5	239.987	46.70	11.85	2.82	28.59	32.78	46.00	-13.22	QP
6	364.260	42.46	14.58	3.09	28.62	31.51	46.00	-14.49	QP

Remark:

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Above 1GHz

Test Polarization: Horizontal



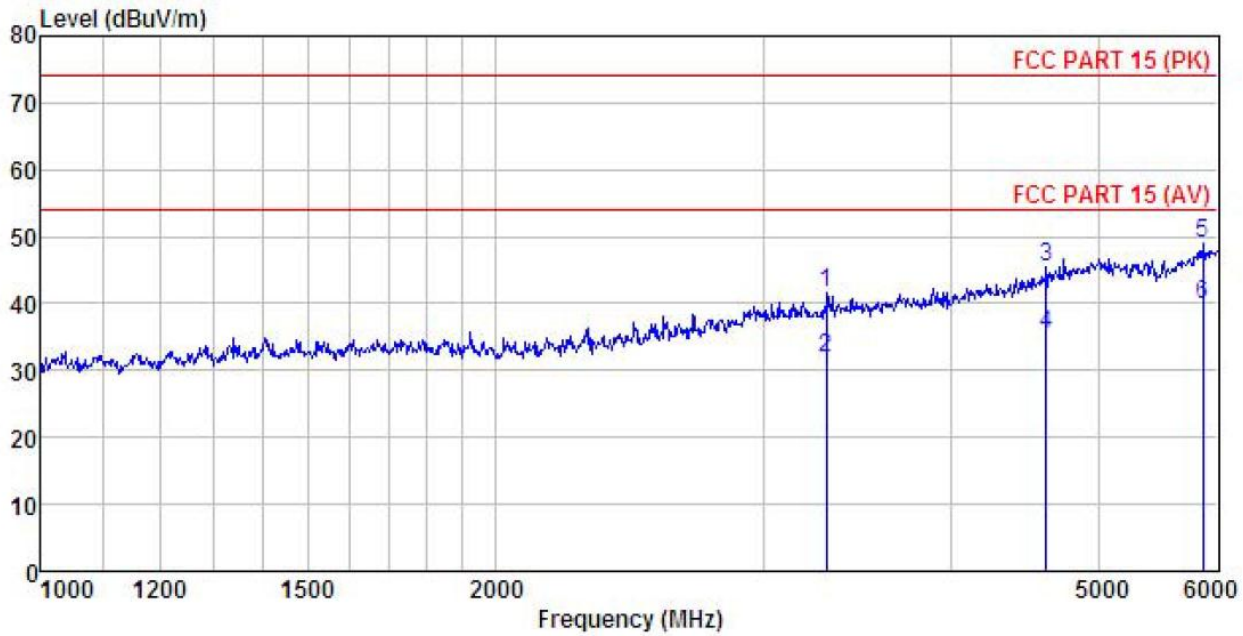
Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) HORIZONTAL
EUT : Tablet PC
Model : K1S
Test mode : PC mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5℃ Huni:55% 101KPa
Test Engineer: Mike
REMARK :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	3461.456	45.88	27.48	5.71	41.42	40.60	74.00	-33.40	Peak
2	3461.456	36.23	27.48	5.71	41.42	30.95	54.00	-23.05	Average
3	4488.392	46.56	29.27	6.79	42.04	44.11	74.00	-29.89	Peak
4	4488.392	36.53	29.27	6.79	42.04	34.08	54.00	-19.92	Average
5	5778.433	47.15	31.17	7.84	42.00	48.17	74.00	-25.83	Peak
6	5778.433	37.29	31.17	7.84	42.00	38.31	54.00	-15.69	Average

Remark:

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Test Polarization: Vertical



Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120(1G18G) VERTICAL
EUT : Tablet PC
Model : K1S
Test mode : PC mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5℃ Huni:55% 101KPa
Test Engineer: Mike
REMARK :

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	3303.900	47.26	27.39	5.52	41.38	41.73	74.00	-32.27	Peak
2	3303.900	37.35	27.39	5.52	41.38	31.82	54.00	-22.18	Average
3	4618.928	47.34	29.90	6.89	42.12	45.59	74.00	-28.41	Peak
4	4618.928	37.19	29.90	6.89	42.12	35.44	54.00	-18.56	Average
5	5861.858	47.24	31.41	7.90	42.03	49.09	74.00	-24.91	Peak
6	5861.858	37.87	31.41	7.90	42.03	39.72	54.00	-14.28	Average

Remark:

1. *Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*